

REMARKS

Claims 1-4, 7-31, and 34-68 remain pending and under consideration. Claims 1, 28, 56, and 57 are independent claims. Claims 1, 7, 16, 20, 24, 28, 34, 48, 56, 57, 59, 63, 67, and 68 have been amended, and Claims 5, 6, 32, and 33 have been cancelled. Reexamination and reconsideration of the application, as amended, are hereby respectfully requested.

Drawings

The drawings are objected to under 37 CFR §1.83(a) as not showing every feature of the invention specified in the claims. Specifically, it is implied in the Office Action that the limitation recited in Claim 14 that "the photodetector active region and the reflecting face are separated by more than about 5 μm at the substrate surface" is not present in the drawings.

Applicants respectfully traverse the objection, for the following reasons. In Fig. 4 of the application as originally filed, a side view is shown with a variety of linear and angular dimensions indicated and labeled with letters. In particular, the linear dimension indicated and labeled as "A" corresponds to the separation between the photodetector active region and the reflecting face at the substrate surface. This dimension is explicitly defined in words in the specification (see ¶ [0036]; page 10 lines 7-9). It is this separation that is recited in Claim 14. Ranges of possible values for the dimension A are given in the specification, including the minimum separation of about 5 μm recited in Claim 14 (see ¶ [0036]; page 10 lines 9-16).

Applicants respectfully request withdrawal of the objection to the drawings.

Claim Objections

Claim 24 is objected to, and alternative language has been suggested. Claim 24 has been amended in accordance with the suggested language. Applicants respectfully request withdrawal of the objection.

Claim Rejections - 35 USC §112

Claims 14, 16-18, 24, and 57-68 are rejected under 35 USC §112 as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention.

The rejections are overcome since it is believed that the claims, as amended, particularly point out and distinctly claim the subject matter which Applicants regard as the invention.

Regarding Claim 14, Applicants respectfully traverse the rejection. It is stated in the Office Action that "it is unclear as to how the photodetector active region and the reflecting face are separated by at least 5 μm at the substrate surface". However, the separation in question is clearly indicated and labeled as dimension "A" in Fig. 4, and corresponds to the separation between the near edge of the photodetector active region and the intersection between the reflecting face and the substrate surface. Ranges of possible values for dimension A (including a minimum of about 5 μm) are explicitly set forth in the specification (see ¶ [0036]; page 10 line 7-16). Therefore, Applicants respectfully submit that it is quite clear "how the photodetector active region and the reflecting face are separated by at least 5 μm ", and respectfully request withdrawal of the rejection.

Regarding Claims 16 and 24, it is asserted in the Office Action that there is insufficient antecedent basis for "the photodetector active area". Accordingly, each of Claims 16 and 24 has been amended to recite "the photodetector active region". Applicants respectfully request withdrawal of the rejection.

Regarding Claims 17 and 18, Applicants respectfully traverse the rejection. It is requested in the Office Action that the "plane of incidence" be defined, and for examining purposes the plane of incidence is considered "as the direction of the incident light normal to the reflecting face". The plane of incidence is defined in standard optics texts (e.g. Hecht, Optics, 4ed; Pearson Addison Wesley; August 2001) as the plane defined at an optical interface by a ray incident on the interface and a vector normal to the interface at the point of incidence. The incident, reflected, and refracted rays all lie within this plane of incidence. In Fig. 17 of the application, a top view of an exemplary embodiment is shown in which the plane of incidence with respect to the reflecting face 1706 is substantially vertical, i.e., the beams incident on and reflected from the reflecting face lie in a common vertical plane. In Figs. 18 and 19, top views of exemplary embodiments are shown in which the plane of incidence with respect to the reflecting face (1706 and 1906, respectively) is non-vertical, i.e., the beams incident on and reflected from the reflecting face do not lie in a common vertical plane. Applicants respectfully submit that the "plane of incidence", whether vertical or non-vertical, is indeed well-defined, and respectfully request withdrawal of the rejection.

Regarding Claim 57, it is asserted in the Office Action that there is insufficient basis for “the transmission member” and “the reflecting face”. Accordingly, Claim 57 has been amended to delete these phrases and replace them with “the optical medium” and “the internal reflector”, respectively. Claims 59, 63, 67, and 68 have been amended to be consistent with amended Claim 57. Applicants respectfully request withdrawal of the rejection.

Regarding Claim 57, it is asserted in the Office Action that it is unclear what is meant by “low-index optical medium”. Applicants respectfully traverse the rejection. The term “low-index” is explicitly defined in the specification as a medium having an index less than about 2.5 (see ¶ [0056]; page 24 lines 4-6). Applicants respectfully request withdrawal of the rejection.

Claim Rejections - 35 USC §§ 102 and 103

Claims 1-68 are rejected variously under 35 USC §§ 102(b) or 102(e) as being anticipated by Fukano (US6353250) or Spaeth et al (US5218223), or under 35 USC § 103 as being unpatentable over Fukano, Spaeth et al, Fukano in view of Spaeth et al, Fukano in view of Yoshimura et al (US5999670), or Fukano in view of Yoshimura and Painter et al (US2002/0122615).

The rejections are overcome since it is believed that Claims 1-4, 7-31, and 34-68, as amended, patentably distinguish over Fukano, Spaeth et al, Yoshimura et al, and Painter et al.

Regarding Claims 1, 28, and 56, none of Fukano, Spaeth et al, Yoshimura et al, or Painter et al shows, teaches, or suggests the limitation recited in Claims 1, 28, and 56, that “an incident optical beam propagating substantially parallel to the substrate surface and transmitted through the entrance face into the substrate is refracted away from the substrate surface”. It is asserted in the Office Action (page 11) that “Spaeth discloses in Fig. 3, an optical beam transmitted substantially parallel through a planar entrance face and is [*sic*] refracted away from the substrate surface”. Applicants respectfully submit that this is not the case.

Fig. 3 of Spaeth et al shows a diverging optical beam propagating substantially parallel to the substrate surface (i.e., the central ray of the diverging beam propagates substantially parallel to the substrate surface). The central ray of the beam is refracted *toward* the substrate surface (i.e., toward the surface having the photodetector active region formed thereon). Therefore, the beam cannot be regarded as being refracted *away* from the substrate surface, as recited in the claims, but rather the beam is

refracted *toward* the substrate surface. The only refracted rays shown in Fig. 3 of Spaeth that propagate away from the substrate surface after refraction are those rays of the diverging beam that are already propagating away from the substrate surface prior to refraction. In other words, such rays do not meet the limitation that a “beam propagating substantially parallel to the substrate surface ... is refracted away from the substrate surface”, as recited in Claims 1, 28, and 56.

Since limitations recited in Claims 1, 28, and 56 are missing from Fukano and from Spaeth et al, neither Fukano nor Spaeth et al can be relied on to support a rejection based on anticipation (MPEP § 2131). Applicants respectfully request withdrawal of the rejections under 35 USC §102.

To establish a *prima facie* case of obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art (MPEP § 2143.03). Since none of Fukano, Spaeth et al, Yoshimura et al, or Painter et al discloses, teaches, or suggests arranging the entrance face so that an incident optical beam propagating parallel to the substrate surface is refracted away from the substrate surface, they cannot support a *prima facie* case of obviousness. The only suggestion that such refraction away from the substrate surface may be desirable is Applicants' own disclosure. Applicants respectfully request withdrawal of the rejections under 35 USC § 103.

Regarding Claim 57, It is asserted in the Office Action (page 7) that “Fukano discloses in Fig. 28, a semiconductor substrate, a photodetector active region formed on the substrate, and a low-index optical medium formed on the semiconductor substrate with an internal reflector positioned at the photodetector active region”. Applicants respectfully submit that this is not the case. Fig. 28 of Fukano shows an optical medium 258, but the optical medium is not integrally formed on the semiconductor substrate, nor does the optical medium have an internal reflector. Fukano nowhere discloses a low-index optical medium integrally formed on the substrate or having an internal reflector, as recited in Claim 57. Since limitations recited in Claim 57 are missing from Fukano, Fukano cannot be relied on to support a rejection based on anticipation (MPEP § 2131). Since none of Fukano, Spaeth et al, Yoshimura et al, or Painter et al discloses, teaches, or suggests these limitations, they cannot support a *prima facie* case of obviousness (MPEP § 2143.03). Applicants respectfully request withdrawal of the rejections.

Other Claim Amendments

In a case recently decided by the United States Court of Appeals for the Federal Circuit (CAFC), however, certain language in one of the patents at issue, similar to language originally employed in some of the claims of the instant application, has been construed in a manner differing from that intended by the Applicants. It is not clear whether the CAFC claim construction is specific to the fact patterns of the decided case, or may be applied more generally. Accordingly, the claims in question have been amended so as to ensure that the claims will be construed in the manner originally intended by the Applicants.

The recently-decided case is *Superguide Corporation v. Directv, Inc.* (CAFC 02-1561, -1562, and -1594, decided 02/12/2004). At least within the context of *Superguide*, the Court has interpreted “at least one of” followed by a conjunctive list of items in the patent in suit (US 5038211) to mean at least one of *each* item in the list. In the instant application, the Applicants intended “at least one of” followed by such a list to mean at least one item *from* the list. It is presumed that this was the interpretation of the Examiner as well. Since the claim construction of the CAFC in *Superguide* may at least raise the possibility of a narrower claim construction than that intended by the Applicants, Claims 20 and 48 have been amended. In each instance, the phrase “at least one of the entrance face and the reflecting face” has been replaced by the phrase “the entrance face or the reflecting face”. In the amended claims, the conjunction “or” is to be construed inclusively (e.g., “a dog, a cat, or a mouse” would be interpreted as “a dog, or a cat, or a mouse, or any two, or all three”; Bryan A. Garner, Elements of Legal Style p. 103, 2nd ed. 2002), unless: i) it is explicitly stated otherwise, e.g., by use of “either...or”, “only one of”, or similar language; or ii) two or more of the listed alternatives are mutually exclusive within the context of the claim, in which case “or” would encompass only those combinations involving non-mutually-exclusive alternatives. Applicants believe that this amendment does not change the scope of the amended claims from the originally intended scope. In particular, the amendment is not a narrowing amendment.

Conclusion

In view of the above, it is submitted that Claims 1-4, 7-31, and 34-68 are in condition for allowance. Reconsideration of the rejections and objections is respectfully requested. Allowance of Claims 1-4, 7-31, and 34-68 at an early date is earnestly solicited.

Respectfully submitted,

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